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ORIGINAL

Complete Specification

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Title: Boat Latch

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The following statement is a full description of this invention, including the best method of performing it known to me/us:

Boat Latch

FIELD OF THE INVENTION

5 The present invention relates to a boat latch. The latch of the present invention is of assistance in the retrieval of boats onto a trailer.

BACKGROUND OF THE INVENTION

Boats carried on trailers are used for both recreational and commercial purposes in
10 significant numbers. Typically boats would be launched from and retrieved from an inclined boat-launching ramp or similar. The boat is secured to the trailer by a latch attaching to the bow of the boat. The boat is released by lowering the boat and trailer into the water to a sufficient depth to allow the boat to float and then releasing the latch. The procedure is reversed when the boat is retrieved: thus, the boat is
15 manoeuvred onto the trailer and then secured by the latch.

The operation is not always easily achieved and, recovery of the boat from the water onto the trailer, in particular, can be difficult to achieve. The present invention offers an alternative to existing boat trailer latches. The boat trailer latch of the invention is
20 particularly suited to new skid bed/roller bed trailer design, which allows the boat to be driven up on to the trailer to its resting position.

SUMMARY OF THE INVENTION

Therefore according to a first aspect of the present invention there is provided a boat
25 latch for securing a boat or the like having a bow ring to a trailer including,

- a roller mount assembly having a roller adapted to guide the bow of a boat into position said roller being attached to an upper end of a kicker arm, said kicker arm being pivotally mounted in a housing;
- a locking pin assembly movable between a cocked and a free position;
- 30 - whereby as a boat is guided into position against the roller mount assembly a rotation of said kicker arm may be induced by pressure exerted against the roller by a boat to thereby activate the locking pin at a position wherein the locking pin engages the bow ring to thereby secure the boat to the trailer.

Preferably, the kicker arm is biased into a disengaged position. More preferably, the kicker arm is biased into position by a compression spring acting against a rear upper side of the kicker arm.

- 5 Preferably, the locking pin is biased into an engaged position and may be secured in the cocked position against a stop

DESCRIPTION OF DRAWINGS

- 10 The above and other objects, features, and advantages of the present invention will be apparent from the following detailed description of a preferred embodiment in conjunction with the accompanying drawings. In the drawings:

Figure 1 shows a boat located on a boat trailer incorporating a latch in accordance with the present invention;

- 15 Figure 2 illustrates in cross-sectional side view the latch of the present invention in a detached position;

Figure 3 illustrates in cross-sectional side view the latch of the present invention in an attached position;

- 20 Figure 4 represents in a first perspective view the latch of the present invention removed from a trailer as viewed from below;

Figure 5 represents in a second perspective view the latch of the present invention removed from a trailer as viewed from above; and

Figure 6 shows an alternate side view of the latch showing a boat secured by a locking pin; and

- 25 Figure 7 illustrates in schematic side view an alternative embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

- 30 The following detailed description of the invention refers to the accompanying drawings. Although the description includes exemplary embodiments, other embodiments are possible, and changes may be made to the embodiments described without departing from the spirit and scope of the invention. Wherever possible, the same reference numbers will be used throughout the drawings and the following
- 35 description to refer to the same and like parts.

Shown in figure 1 is a boat trailer latch 10 in accordance with a first aspect of the present invention. The latch 10 is attached to, and forms a part of a conventional boat trailer 12. A boat 14 is shown in the secured position in the drawing.

5 The boat latch 10 can be seen in greater detail in figures 2-5.

The latch 10 includes a mounting roller 16 located in a roller-mount assembly 18. As can be seen from the drawings the mounting roller 16 is held generally horizontally in use and is adapted to contact the bow of the boat 14 during retrieval. The mounting
10 roller 16 is freely rotatable about a horizontal axis. The roller mount assembly 18 serves to hold the roller 16 in position and consists of a pair of side arms 22 attached to the roller at ends thereof through an axis 24 of the roller 16, each of the side arms 22 projecting from a base member 26 to thereby complete the roller-mount assembly 18. The roller 16 is of a type conventionally used in boat trailers and is manufactured
15 of nylon or other suitable material.

Extending generally downwardly from the base member 26 is a kicker arm 28. The kicker arm 28 is seen to advantage in figures 2 and 3. The kicker arm 28 consists of a flat plate having a generally central transverse pivot point 30. The pivot 30 is, in turn,
20 secured in within and against the walls of a channel member 32. The channel member 32 is approximately L shaped having a longer limb 34 and a shorter limb 36. The longer limb 34 is attached, through a mounting plate 37, to an upright 38 extending from the boat trailer 12. The shorter 36 limb of the channel member 32 is open-ended to allow the kicker arm 28 to extend upwardly through the open end to
25 the base member 26.

It can be seen from the drawings that the kicker arm 28 occupies most of the length of the shorter limb 36. As has been noted the kicker arm 28 is secured to the channel 32 by a pivot point 30. The kicker arm 28 is generally freely rotatable about the pivot 30
30 within the confines of the channel member 32. Nylon bushes and washers and a split pin are used to secure this arrangement and facilitate the free movement of the kicker arm 28.

The kicker arm 28 is, however subject to influences beyond the mere shape of the
35 channel 32.

An uppermost part of the kicker arm 28 has a rearmost projecting tang 40. The tang 40 is received in a cylindrical housing 42 positioned on an inner wall of the located within the shorter limb 36 of the channel member 32. The housing 42 also serves to hold a kicker arm compression spring 44. The outer edge of the kicker arm 28 is
 5 profiled and cut so as to allow a close fit between the kicker arm 28 and the housing 42. The kicker arm compression spring 44 acts on the upper end of the kicker arm 28 to bias the kicker arm into a resting position.

Thus, in the orientation shown in the drawings the kicker arm 28 is biased by the
 10 compression spring 44 so that it maintains an upright position, and more specifically, the kicker arm 28 is biased in a clockwise direction. However, the kicker arm is attached at its upper end the roller 16. Force acting on the roller 16 is therefore able to counteract the effect of the compression spring 44 as indicated in figure 2.

15 At a lowermost end of the kicker arm 28 there is a lower tang 46 that is forwardly projecting. An aperture 49 is cut into the channel member 32 to allow the tang 46 to extend therethrough. Counter clockwise rotation of the kicker arm 28 about the pivot point 30 allows the tang 46 to contact a locking pin 48. As will be described the movement of the locking pin 48 activates the locking mechanism.

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The locking pin mechanism is positioned forwardly of the kicker arm 28 and is, in use, closer to the boat 14. A pair of parallel, outermost forwardly extending flanges 50 is attached one to each side of the shorter limb of the channel member 32. The flanges 50 can be seen most clearly in figure 4.

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The flanges 50 terminate in outwardly directed guide wings 52. The guide wings 52 serve to avoid damage to the boat as the boat 14 is guided onto the trailer 12. The guide wings 52 are covered in a nylon material. The guide wings 52, in use, rest below the roller 16 and act in concert with the roller 16 to position the boat during
 30 retrieval.

The locking pin 48 is a U shaped member that passes through, and is secured in, the flanges 50 and then turns through 180° to pass below the flanges 50. The locking pin 48 also passes through a barrel 54 positioned adjacent a flange 50. Within the barrel
 35 54 is a locking pin spring and associated washer. The locking pin spring ensures that the locking pin 48 is maintained in position with the lower arm passing below the guide

wings 52 and flanges 50. By pulling on the locking pin 48 it is possible to act against the locking pin spring and to withdraw the locking pin 48.

The locking pin 48 can be withdrawn against the action of the locking pin spring to a
5 cocked position. The locking pin 48 is maintained in this position by the lower arm of the U-shape bearing against a locking pin stop plate 56 attached to an outer surface of the channel member 32.

As the boat 14 is driven forward on to the trailer 12 the guide wings 52 locate the D-
10 shackle or U-bolt on the bow of the boat to its final resting position. The bow of the boat 14 then encounters the roller 16, which then rotates on its horizontal axis 24. At the same time the movement of the boat against the roller 16 exerts a pressure thereon that results in a rotation of the roller 16 backwards, that is in a counter clockwise direction as viewed from figure 2 around the pivot point 30 and against the
15 action of the compression spring 44. This of course rotates the whole of the kicker arm 28 and the lowermost point of the kicker arm 28 and the tang 46 are also rotated counter clockwise and the tang 46 emerges through the aperture 48 to strike the lower arm of the locking pin 48. The locking pin 48 is thereby moved forwardly and released from the locking pin stop plate 56. The spring in the barrel 54 shoots the locking pint
20 48 across the bow of the boat passing through the locking pin 48 through the D-shackle or U-bolt on the bow of the boat thereby securing the boat to the trailer.

Thus then, as the boat is driven, winched or otherwise hauled onto the trailer the operator is in a position to monitor the gradual movement of the boat and, at a point
25 when the locating the D-shackle or U-bolt on the bow of the boat in line with the desired resting position. On the trailer, the action of the boat moving against the roller 16 activates the locking pin 48 out of the cocked position, that is, engagement with the stop plate 56 and the locking pin moves to collect the boat through the shackle.

30 To facilitate this process the end of the locking pin that passes through the shackle on the boat is tapered to allow easy entry through the shackle. Once the boat has been secured an R clip 58 can be used to lock the locking pin 48 against inadvertent release. In addition, a washer 60 is fixed to the rear side of the locking pin 48 to thereby prevent excess travel of the pin.

The latch 10 of the invention may incorporate additional features including a safety catch 62 that loops over the lower arm of the locking pin 48 and prevents inadvertent firing of the pin.

5 Shown in figure 7 is an alternative form of the present invention. The boat latch 100 shown in figure 7 is in many respects similar to the latch 10 shown in figures 1-6 and like numerals have been used to indicate like parts.

In the latch 100, the roller mount assembly 18 is attached to the channel member 32 10 through adjustable side flanges 61. The side flanges 61 are attached to a winch plate 64 and are pivotally movable about a pivot pin 63 located at the end of the winch plate 64. The winch plate 64 is welded to the mounting plate 37 and is further supported in position by means of support 65. The degree of movement of the adjustable side flanges 61 is constrained by arcuate slots that receive pins 66.

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The relative angle at which the roller mount assembly 18 is presented to a boat hull is variable thereby allowing the latch 100 to be used with a variety of boat hull angles.

Further advantages and improvements may be made to the present invention without 20 deviating from its scope. In particular the angle and position at which the latch assembly is mounted and the dimensions of the channel member are able to varies to accommodate differing boat geometries. Thus, although the invention has been shown and described in what is conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope 25 and spirit of the invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices and apparatus.

In any claims that follow and in the summary of the invention, except where the 30 context requires otherwise due to express language or necessary implication, the word "comprising" is used in the sense of "including", i.e. the features specified may be associated with further features in various embodiments of the invention.